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| 10/675,367 | 09/30/2003 | Liang Jiang | 132347-1 | 5979 |

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
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NISKAYUNA, NY 12309

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| EXAMINER |
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ROE, JESSEE RANDALL

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| ART UNIT | PAPER NUMBER |
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1742

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09/26/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/675,367

Applicant(s)

JIANG ET AL.

Examiner

Jessee Roe

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-21 is/are pending in the application.
- 4a) Of the above claim(s) 11-18,20 and 21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2, 4-10 and 19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 23 July 2007 has been entered.

Status of the Claims

Claims 1-2 and 4-21 are pending wherein claim 1 is amended; claim 3 is canceled; and claims 11-18 and 20-21 are withdrawn from consideration.

Status of Previous Rejections

The previous rejections of claims 1-2, 4-8, 10 and 19 under 35 U.S.C. 102(b) as being anticipated by Watanabe (US 3,976,480) is withdrawn in view of the Applicant's amendment to the claims. The previous rejection of claims 1-2, 4-10 and 19 as being unpatentable over Watanabe (US 3,976,480) is withdrawn in view of the Applicant's amendment to the claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 4-8 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Twigg et al. (US 3,723,108).

In regards to claim 1, Twigg et al. ('108) discloses (Table 1, Alloy G) a nickel-containing alloy comprising a composition as shown in the table on the following page.

| Element | From Instant Claims (wt%) | Alloy G of Twigg et al. ('108) (wt%) | Alloy G of Twigg et al. ('108) (at%) |
|---------|---------------------------|--------------------------------------|--------------------------------------|
| C | about 0.02 to about 0.15 | 0.045 | 0.21 |
| Cr | about 14 to about 28 | 23.5 | 25.49 |
| Co | about 10 to about 23 | 19.8 | 18.95 |
| Nb (Cb) | about 0.8 to about 3 | 2.05 | 1.24 |
| Ti | about 1.50 to about 4.50 | 3.0 | 3.53 |
| Al | about 1.50 to about 4.50 | 1.55 | 3.24 |
| Zr | up to about 0.20 | 0 | 0 |
| Mo | - | 2.05 | 1.21 |
| Ni | Remainder | 48.005 (Remainder) | 46.13 |

Still regarding claim 1, Twigg et al. ('108) discloses (Table 1, Alloy G) a nickel-containing alloy substantially devoid of tantalum with a composition as shown above. The essential weight percentages of carbon, chromium, cobalt, aluminum, titanium, and niobium (columbium) are present. The weight percentages were converted to atomic percentages and are shown in column above. The atomic ratio of aluminum to titanium is 0.918, which would be within the range of about 0.5 to about 1.5.

With respect to the recitation "up to" for zirconium, the Examiner notes that the instant invention would not require zirconium because the recitation "up to" would include 0 weight percent.

In regards to claim 2, Twigg et al. ('108) discloses (Table 1, Alloy G) that 3 weight

percent titanium and 1.55 weight percent aluminum would be present in the nickel-containing alloy. The sum of the weight percentages of these elements would be 4.55 weight percent, which would be within about 3 and about 9 weight percent.

In regards to claim 4, Twigg et al. ('108) discloses (Table 1, Alloy G) that 3 weight percent titanium, 1.55 weight percent aluminum, and 2.05 weight percent columbium (niobium) would be present in the nickel-containing alloy. The sum of the weight percentages of these elements would be 6.60 weight percent which would be within the range of about 3 to about 12 weight percent.

In regards to claim 5, Twigg et al. ('108) discloses (Table 1, Alloy G) a nickel-containing alloy with a composition as shown above. The weight percent of nickel is 48.005 weight percent, which would be within the range of about 40 to about 70 weight percent.

In regards to claim 6, Twigg et al. ('108) discloses (Table 1, Alloy G) a nickel-containing alloy with a composition comprising cobalt and carbon as shown above.

In regards to claim 7, Twigg et al. ('108) discloses (Table 1, Alloy G) a nickel-containing alloy with a composition comprising 19.8 weight percent cobalt, which is within the range of about 10 to about 23 weight percent.

In regards to claim 8, Twigg et al. ('108) discloses (Table 1, Alloy G) a nickel-containing alloy with a composition comprising 0.045 weight percent carbon, which is within the range of about 0.02 to about 0.15 weight percent carbon.

In regards to claim 19, Twigg et al. ('108) discloses using nickel-chromium-cobalt alloys for gas turbine engine components (col. 1, lines 14-21 and col. 1, lines 61-70).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 4-8, 10 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Twigg et al. (US 3,723,108).

In regards to claim 1, Twigg et al. ('108) discloses a nickel-containing alloy comprising a composition as shown in the table below (col. 1, line 71 – col. 2, line 33).

| Element | From Instant Claims (wt%) | Twigg et al. ('108) (wt%) | Overlapping Range (wt%) |
|----------------|--------------------------------------|--------------------------------------|------------------------------------|
| C | about 0.02 to about 0.15 | 0.01 – 0.20 | about 0.02 – about 0.15 |
| Cr | about 14 to about 28 | 23.5 – 26 | 23.5 – 26 |
| Co | about 10 to about 23 | about 10 to about 24 | about 10 to about 23 |
| Nb (Cb) | about 0.8 to about 3 | about 0.25 to 2 | about 0.8 to 2 |
| Ti + Al | about 3 to about 9 | 4.25 to 5.6 | 4.25 to 5.6 |
| Zr | up to about 0.20 | up to about 0.15 | up to about 0.15 |
| Ni | Remainder | Remainder | Remainder |

The Examiner notes that the ranges disclosed by Twigg et al. (108) for carbon, chromium, cobalt, zirconium, niobium (columbium), titanium, aluminum, and zirconium for a nickel containing alloy are within the claimed ranges of the instant invention, which is a prima facie case of obviousness exists. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed ranges from the ranges disclosed by Twigg et al. ('108)

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because Twigg et al. ('108) disclose the same utility throughout the disclosed ranges.

Still regarding claim 1, Twigg et al. ('108) further disclose that the ratio of titanium to aluminum would be from about 1:1 to 4:1, which overlaps the range of about 0.5 to about 1.5 as in the instant invention. Twigg et al. ('108) also disclose that tantalum may be introduced incidentally with columbium in an amount of up to about one-tenth thereof, which would meet the limitation of being substantially devoid of tantalum.

In regards to claim 2, Twigg et al. ('108) discloses that 4.25 to 5.60 weight percent titanium and aluminum would be present in the nickel-containing alloy, which would be within the range of about 3 to about 9 weight percent titanium and aluminum (col. 1, line 71 – col. 2, line 33).

In regards to claim 4, Twigg et al. ('108) discloses that about 4.50 to 7.6 weight percent titanium, aluminum, and niobium (columbium) would be present in the nickel-containing alloy, which would be within the range of about 3 to about 12 weight percent titanium and aluminum (col. 1, line 71 – col. 2, line 33).

In regards to claim 5, Twigg et al. ('108) discloses that about 40 to about 65 weight percent nickel would be present in the nickel-containing alloys, which would be within the range of about 40 to about 70 weight percent nickel (col. 1, line 71 – col. 2, line 33).

In regards to claim 6, Twigg et al. ('108) disclose that the nickel-containing alloy would comprise cobalt and carbon (col. 1, line 71 – col. 2, line 33).

In regards to claim 7, Twigg et al. ('108) discloses that the nickel-containing alloy would contain about 10 to 24 weight percent cobalt, which overlaps the range of about

10 to about 23 weight percent cobalt (col. 1, line 71 – col. 2, line 33).

In regards to claim 8, Twigg et al. ('108) discloses that the nickel-containing alloy would contain about 0.01 to about 0.2 weight percent carbon, which overlaps the range of about 0.02 to about 0.15 weight percent carbon (col. 1, line 71 – col. 2, line 3).

In regards to claim 10, Twigg et al. ('108) disclose that 0.001 to 0.05 weight percent boron would be added to the nickel-containing alloy, which overlaps the range of about 0.001 to about 0.025 weight percent boron.

In regards to claim 19, Twigg et al. ('108) discloses using nickel-chromium-cobalt alloys for gas turbine engine components (col. 1, lines 14-21 and col. 1, lines 61-70).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Twigg et al. (US 3,723,108) as applied to claims 1 and 6 above, and further in view of the ASM Specialty Handbook.

In regards to claim 8, Twigg et al. ('108) disclose a nickel-containing alloy as shown above comprising 0.50 to 2.0 weight percent molybdenum (col. 1, line 71 – col. 2, line 3), but Twigg et al. ('108) do not specify that the nickel-containing alloy would comprise tungsten.

The ASM Specialty Handbook discloses that molybdenum and tungsten would both perform the function of improving high temperature strength and creep strength of nickel-base alloys (pg. 167).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute a corresponding amount of tungsten for molybdenum, as disclosed by the ASM Specialty Handbook, in the nickel-containing

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alloy, as disclosed by Twigg et al. ('108), because molybdenum and tungsten would be functionally equivalent in improving high temperature strength and creep strength, as disclosed by the ASM Specialty Handbook. See MPEP 2144.06.

Response to Arguments

Applicant's arguments with respect to claims 1-2, 4-10 and 19 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571) 272-5938. The examiner can normally be reached on Monday-Friday 7:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JR


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